

Figure 1

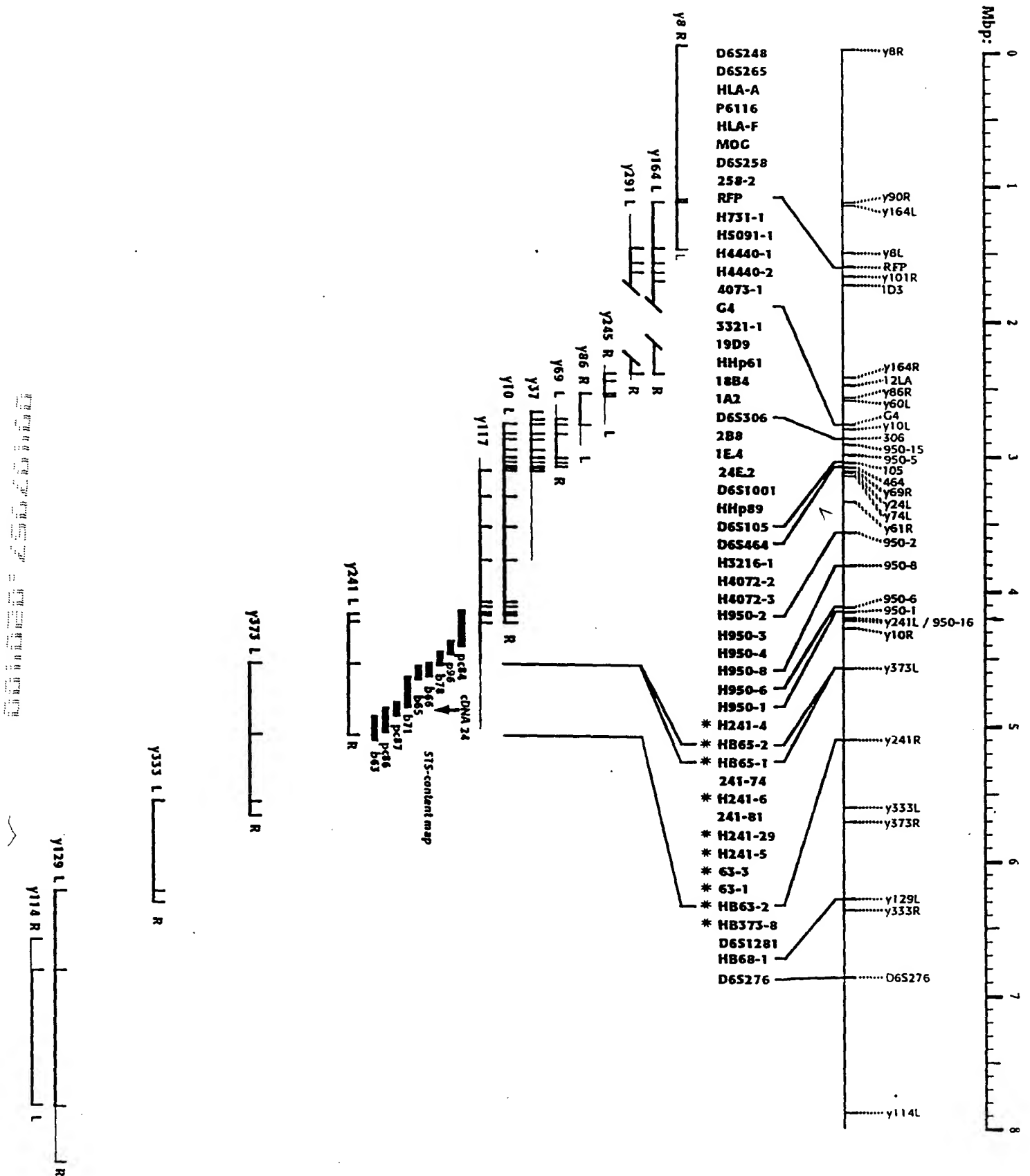


Figure 2

Patients	Markers										
	241-4	65-2	65-1	241-6	241-29	24d1	241-5	63-3	63-1	63-2	373-8
HC2	144	161	208	193	117	A	108	169	151	113	151
	144	159	206	205	113	A	108	169	151	113	151
HC22	144	159	206	205	113	A	108	169	151	113	151
	144	161	208	193	117	A	108	169	151	113	151
HC25	144	167	210	205	113	A	108	169	151	113	159
	144	159	206	205	113	A	108	169	151	113	151
HC29	144	159	206	205	113	A	108	169	135	133	155
	144	159	208	205	113	A	108	169	151	113	151
HC41	144	159	206	205	113	A	108	169	151	113	151
	144	159	206	205	113	A	108	169	151	113	151
HC50	144	161	210	193	119	A	108	169	151	113	151
	144	159	206	205	113	A	108	169	151	113	151
HC75	144	159	206	205	113	A	108	167	139	131	153
	144	159	206	205	113	A	108	169	151	113	149
HC87	144	161	208	193	117	A	108	169	151	113	147
	144	159	206	205	113	A	108	169	151	113	151
HC91	144	208	208	193	117	A	108	169	151	113	155
	144	159	206	205	113	A	108	169	151	113	149
HC125	146	161	210	205	115	A	108	169	151	113	153
	144	159	206	205	113	A	108	169	151	113	151
HC143	146	161	210	193	117	A	108	169	151	113	151
	146	159	206	205	113	A	108	169	151	113	151

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 -310 taaatattta aatatctaaa gttcagatca gaacattgcg aagctacttt
 -260 cccaatcaa caacaccct tcaggattta aaaaccaagg gggacactgg
 -210 atcacctagt gtttcacaag caggtagctt ctgctgtagg agagagagaa
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 -60 tttccccgcc ccccaaaaga agcggagatt taacggggac gtgcggccag
 -10 agctggggaa
 1 ATGGGCCCGC GAGCCAGGCC GCGCTTCTC CTCCTGATGC TTTTCAGAC
 51 CCTGGTCCCTG CAGGGGCGCT TGCTGCgtga gtccgagggc tgcgggcgaa

 101 ctaggggcgc ggcgggggtg gaaaaatcga aactagcttt ttctttgcgc
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 201 ctctccctac tttctgcgtc cagaccccggt gagggagtgc ctaccactga
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 351 agaatgcttt taaataaatc tcgtagtctc tcacttgagc tgagctaagc
 401 ctggggctcc ttgaacctgg aactcgggtt tatttccaat gtcagctgtg
 451 cagttttttc cccagtcac tcacaacagg aagttcttcc ctgagtgtt
 501 gccgagaagg ctgagcaaac ccacagcagg atccgcacgg ggtttccacc
 551 tcagaacgaa tgcgttgggc ggtgggggag cgaaagagtg gcgttgggga

 601 tctgaattct tcaccattcc acccactttt ggtgagacct ggggtggagg
 651 tctctagggt gggaggctcc tgagagaggc ctacctggg ctttcccca
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 1901 gtaatgggct cagaagagga gccacaaaca aggttggtgca ggcgcctgta

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1951 ggctgtggtg tgaattctag ccaaggagta acagtgatct gtcacaggct
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 2151 gtctcctgaa tatattctga aggaagtgtc tgaaggattc tatgttgtgt
 2201 gagagaaaga gaagaattgg ctgggtgtag tagctcatgc caaggaggag
 2251 gccaggaga gcagattcct gagctcagga gttcaagacc agcctgggca
 2301 acacagcaaa accccttctc taaaaaaat aaaaaatta gctgggtgtg

 2351 gtggcatgca cctgtgatcc tagctactcg ggaggctgag gtggagggtg
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 2451 gtaactcagc ctaggtgaca gagcaagacc ctgtctcccc tgacccctg
 2501 aaaaagagaa gagttaaagt tgactttgtt ctttatttta attttattgg
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G T

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 3751 gaggctcttg gggagcaggg aagaggggaag gaatttgctt cctgagatca
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 4101 ACAGCTGCAG CAGTTCCTGG AGCTGGGGAG AGGTGTTTTG GACCAACAAG
 4151 gtatggtgga aacacacttc tgcccctata ctctagtggc agagtggagg
 4201 aggttgcagg gcacggaatc cctggttggg gtttcagagg tggctgaggc

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4251 tgtgtgcctc tccaaattct ggaagggac tttctcaatc ctagagtctc
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4351 cttttctcca tgcatatggc tcaaagggaa gtgtctatgg cccttgcttt
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A

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5601 tgagatgagg atctgtctct tgtagggggg tgggctgagg gtggcaatca
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 6451 ccaagggtct tttgggatat tgggttatga tcaactgggg gtcattgaag
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8701 aaagagtctt tttttttttt ttgagactct attgccagg ctggagtgca
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8851 tgcccggcta atttttgtat ttttagtaga gacagggttt caccatgttg
8901 gccaggctgg tctcgaaact tctgacctc gtgatccgcc tgccctggcc
8951 tcccaaagtg ctgagattac aggtgtgagc caccctgccc agccgtcaaa

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9001 agagtcttaa tatatatatc cagatggcat gtgtttactt tatgttacta
 9051 catgcacttg gctgcataaa tgtggtacaa gcattctgtc ttgaaggcca

 9101 ggtgcttcag gataccatat acagctcaga agtttcttct ttaggcatta
 9151 aatttttagca aagatatctc atctcttctt ttaaaccatt ttcttttttt
 9201 gtggttagaa aagttatgta gaaaaaagta aatgtgattt acgctcattg
 9251 tagaaaagct ataaaatgaa tacaattaaa gctgttattt aattagccag
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 9351 taaaaatgca tatacttttaa taaatgtata ttgtattgta tactgcatga
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Figure 4

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atgggccccg cgagccagge
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S H S L H Y L F M G A S E Q D L G L S L

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F E A L G Y V D D Q L F V F Y D H E S R

gtgtggagcc ccgaactcca tgggtttcca gtagaatttc aagccagatg tggtgcagc
R V E P R T P W V S S R I S S Q M W L Q

tgagtacagag tctgaaaggg tgggatcaca tgttcaactgt tgacttctgg actattatgg
L S Q S L K G W D H M F T V D F W T I M

aaaatcacaa ccacagcaag gagtcccaca ccctgcaggt catcctgggc tgtgaaatgc
E N H N H S K E S H T L Q V I L G C E M

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Q E D N S T E G Y W K Y G Y D G Q D H L

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E F C P D T L D W R A A E P R A W P T K

tggagtggga aaggcacaag attcggggcca ggcagaacag ggcctacctg gagagggact
L E W E R H K I R A R Q N R A Y L E R D

gccctgcaca gctgcagcag ttgctggagc tggggagagg tgttttggac caacaagtgc
C P A Q L Q Q L L E L G R G V L D Q Q V

ctccttttggg gaagggtgaca catcatgtga cctcttcagt gaccactcta cgggtgtcggg
P P L V K V T H H V T S S V T T L R C R

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A L N Y Y P Q N I T M K W L K D K Q P M

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D A K E F E P K D V L P N G D G T Y Q G

ggataaacctt ggctgtaccc cctgggggaag agcagagata tacgtgctag gtggagcacc
W I T L A V P P G E E Q R Y T C Q V E H

caggccttga tcagcccttc attgtgatct gggagccctc accgtctggc accctagtca
P G L D Q P L I V I W E P S P S G T L V

ttggagtcat cagtgggaatt gctgtttttg tcttcatctt gttcatttga attttgttca
I G V I S G I A V F V V I L F I G I L F

taatattaag gaagaggcag ggttcaagag gagccatggg gcactacgtc ttagctgaac
I I L R K R Q G S R G A M G H Y V L A E

gtgagtga
R E *

ca cgcagcctgc agactcactg tgggaaggag acaaaaactag agactcaaag
agggagtgc tttatgagct cttcatgttt caggagagag ttgaacctaa acatagaaat
tgccctgacga actccttgat cttagccttc tctgttcatt tcctcaaaaa gatctccccca

FIGURE 5

PCR Primers used for Amplification of 24d1 Alleles

24d1.P1 (forward primer)
5'-TGGCAAGGGTAAACAGATCC-3' (SEQ ID NO:13)
24d1.P2 (reverse primer)
5'-CTCAGGCACTCCTCTCAACC-3' (SEQ ID NO:14)

OLA Oligonucleotides for 24d1

Upstream Oligonucleotides (5'-biotinylated)

24d1.A (common allele)
5'-bio-GGAAGAGCAGAGATATACGTG-3' (SEQ ID NO:15)
24d1.B (hemochromatosis allele)
5'-bio-GGAAGAGCAGAGATATACGTA-3' (SEQ ID NO:16)

Downstream Oligonucleotides (5'-phosphorylated)

24d1.X 5'-p-CCAGGTGGAGCACCCAGG-dig-3' (SEQ ID NO:17)

FIGURE 6

Figure 6a

5'—TATTTCTTCCTCCAACCTATAGAAGGAAGTGAAAGTTCCAGTCTTCCTGGCAAGGGTAAACAGATCCCC
TCTCCTCATCCTTCCTCTTTCCTGTCAAGTGCCTCCTTTGGTGAAGGTGACACATCATGTGACCTCTTCAG
TGACCACTCTACGGTGTGGGCCTTGAACCTACTACCCCCAGAACATCACCATGAAGTGGCTGAAGGATA
AGCAGCCAATGGATGCCAAGGAGTTCGAACCTAAAGACGTATTGCCCAATGGGGATGGGACCTACCAGG
GCTGGATAACCTTGGCTGTACCCCCTGGGGAAGAGCAGAGATATACGTGCCAGGTGGAGCACCCAGGC
CTGGATCAGCCCCCTATTGTGATCTGGGGTATGTGACTGATGAGAGCCAGGAGCTGAGAAAATCTATTGG
GGGTTGAGAGGAGTGCCTGAGGAGGTAATTATGGCAGTGAGATGAGGATCTGCTCTTTGTTAGGGGGTG
GGCTGAGGGTGGCAATCAAAGGCTTTAACTT-3' (SEQ ID NO:20)

Figure 6b

5'—TATTTCTTCCTCCAACCTATAGAAGGAAGTGAAAGTTCCAGTCTTCCTGGCAAGGGTAAACAGATCCCC
TCTCCTCATCCTTCCTCTTTCCTGTCAAGTGCCTCCTTTGGTGAAGGTGACACATCATGTGACCTCTTCAG
TGACCACTCTACGGTGTGGGCCTTGAACCTACTACCCCCAGAACATCACCATGAAGTGGCTGAAGGATA
AGCAGCCAATGGATGCCAAGGAGTTCGAACCTAAAGACGTATTGCCCAATGGGGATGGGACCTACCAGG
GCTGGATAACCTTGGCTGTACCCCCTGGGGAAGAGCAGAGATATACGTACCAGGTGGAGCACCCAGGC
CTGGATCAGCCCCCTATTGTGATCTGGGGTATGTGACTGATGAGAGCCAGGAGCTGAGAAAATCTATTGG
GGGTTGAGAGGAGTGCCTGAGGAGGTAATTATGGCAGTGAGATGAGGATCTGCTCTTTGTTAGGGGGTG
GGCTGAGGGTGGCAATCAAAGGCTTTAACTT-3' (SEQ ID NO:21)

Figure 7

III protein	M G P R A R P A L L L L M L L L L Q T A V L Q G R L R S H S L H Y L E M G A S E O D L G L S L E E A L G Y V D D O L E V F
RIA	- M G S I P P R T L L L L L A G A L T L K D T Q A G S H S H R Y E Y T S V S R P G L G E P R E I I V G Y V D D O L E V R
IMHC	- M A V M A P R T L V L L L S G A L A L T Q T W A G S H S H R Y E F T S V S R P G R G E P R E I A V G Y V D D O L E V R
III protein	Y D H E - - S R R V E P R T P W V S S R I S S O M L Q L S Q S L K G W D H M E T V D F W T I M E N H N H S - K E S H T
RIA	E D S D A A S P R M E Q R A P W M G - Q V E P E Y W D Q Q T Q I A K D T A Q T E R V N L N T A L R Y Y N Q S A A G S H T
IMHC	E D S D A A S Q R M E P R A P W I E - Q E G P E Y W D G E T R K K V K A H S Q T H R V D L G T L R G Y Y N Q S E A G S H T
III protein	L Q V I L G C E M Q E D N - S T E G Y W K Y G Y D G Q D H L E F C P D T L D W R A A E P R A W P T K L E W E R H K I R A
RIA	F Q T M E G C E V W A D G R F F H G Y R Q Y A Y D G A D Y I A L N E D L R S W T A A D T A A Q N T Q R K W E A A G E A E
IMHC	L Q M E F G C D V G S D W R F L R G Y H Q Y A Y D G K D Y I A L K E D L R S W T A A D M A A Q T T K H K W E A A H V A E
III protein	R Q N R A Y L E R D C P A Q L Q O L L E L G R G V L D Q O V P E L V K V T H H V T S S - V T T I R C R A L N Y Y P O N I
RIA	R - H R A Y L E R E C V E W L R R Y L E M G K E T L Q R A D E P K A H V T H H P A S D R E A T L R C W A L G E F P A E I
IMHC	Q - L R A Y L E G T C V E W L R R Y L E N G K E T L Q R T D A P K T H M T H H A V S D H E A T L R C W A L S E F Y P A E I
III protein	T M K M L K D - - K Q P M D A K E F E P K D V L P N G D G T Y Q G W I T L A V P P G E E Q R Y T C Q V E H P G L D O P L
RIA	S L T W Q R D G E D Q T Q D T E L V E T R - - P G G D G T F Q K W A A Y V V P S G E E Q R Y T C R V Q H E G L P E P L
IMHC	T L T W Q R D G E D Q T Q D T E L V E T R - - P A G D G T F Q K W A A V V P S G Q E Q R Y T C H V Q H E G L P K E L
III protein	I V I W E P S P S - G T L V I G V I S G I A V E V V I L F I G I L P I I L R K R Q G S R G A M G H Y V L A E R E - - -
RIA	T L T W E P P A Q P T A L I V G I V A G - V L G V L L I L G A V V A V V R R K K H S S D G K G R Y T P A A G C H R D Q
IMHC	T L R W E P S S Q P T I P I V G I I A G L V L F G A V I T G A V V A A V W W R R K S S D R K G G S Y S Q A A S S D S A Q
III protein	- - - - -
RIA	G S D D S L M P - - -
IMHC	G S D V S L T A C K V

Figure 8

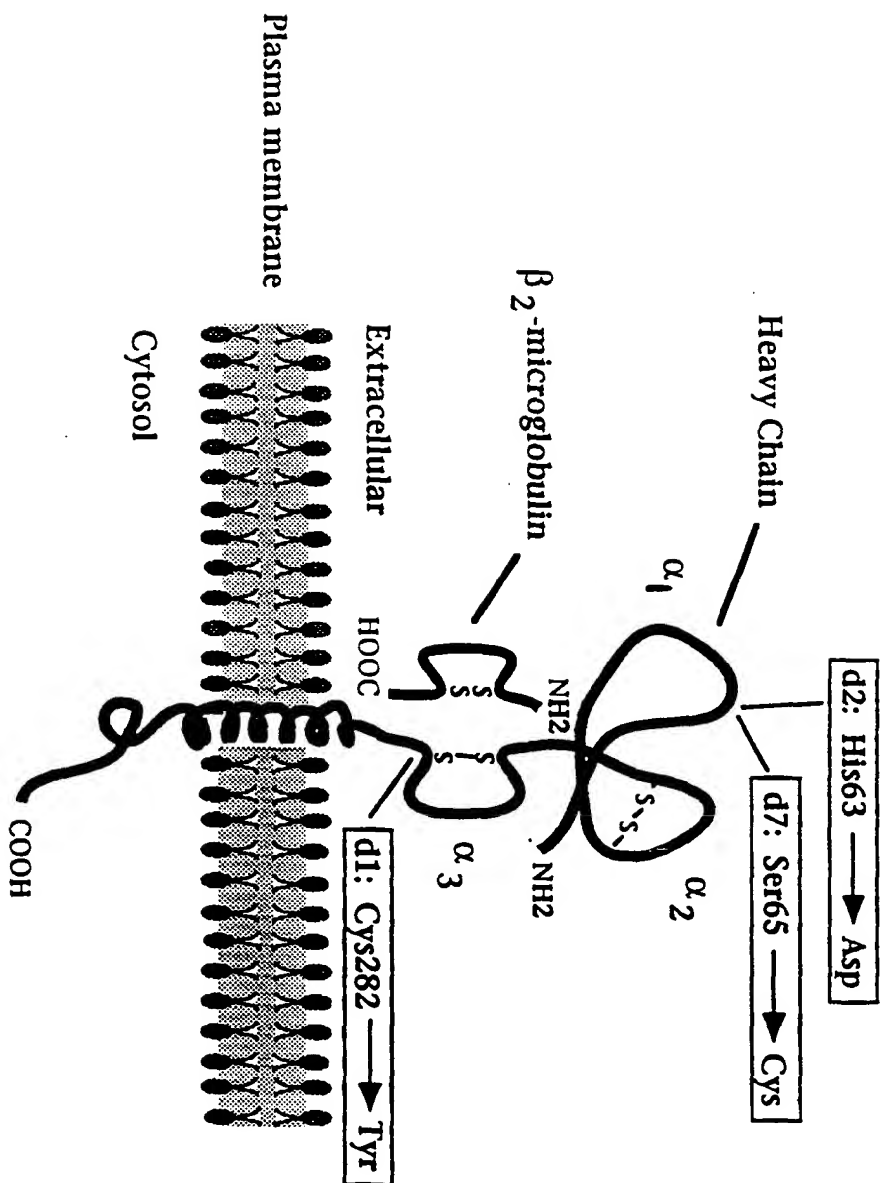


FIGURE 9

PCR Primers used for Amplification of 24d2 Alleles

- 24.P2.1 (forward primer)
5'-ACATGGTTAAGGCCTGTTGC-3' (SEQ ID NO:24)
- 24.P2.2 (reverse primer)
5'-GCCACATCTGGCTTGAAATT-3' (SEQ ID NO:25)

OLA Oligonucleotides for 24d2

Upstream Oligonucleotides (5'-biotinylated)

- 24d2.A (common allele)
5'-bio-AGCTGTTCGTGTTCTATGATC-3' (SEQ ID NO:26)
- 24d2.B (hemochromatosis allele)
5'-bio-AGCTGTTCGTGTTCTATGATG-3' (SEQ ID NO:27)

Downstream Oligonucleotides (5'-phosphorylated)

- 24d2.X 5'-p-ATGAGAGTCGCCGTGTGGA-dig-3' (SEQ ID NO:28)